Progress Toward Completion of the Mathematics Major

Applied Mathematics Concentration

Arts and Sciences students may be admitted to the math major after successfully completing a semester of multivariable calculus, a semester of linear algebra, and a 3- or 4-credit computer programming course. To apply, visit math.cornell.edu/major.

Student's Name _____ **Net ID** _____ **Faculty Advisor** _____

Courses needed to complete the major

_____ initials _____

_____ date _____

Math majors must complete **9 courses** for the major, as described in items 1–3 below, with a **minimum grade of C–**. No course may be used to satisfy more than one requirement. MATH courses numbered between 4980 and 5999 do not count.

_____ At least two of the MATH courses taken must be at the 4000 level (or above).

1. Two Courses in Algebra. (___ transfer credit applied, see reverse)

_____ MATH 3320 - Introduction to Number Theory
_____ MATH 3340 - Abstract Algebra*
_____ MATH 3360 - Applicable Algebra*
_____ MATH 4310 - Linear Algebra* **Discontinued:** _____ MATH 4315*
_____ MATH 4330 - Honors Linear Algebra*
_____ MATH 4340 - Honors Introduction to Algebra*
_____ MATH 4370 - Computational Algebra
_____ MATH 4500 - Matrix Groups
_____ MATH 4560 - Geometry of Discrete Groups

2. Two Courses in Analysis. (___ transfer credit applied, see reverse)

_____ MATH 3110 - Introduction to Analysis*
_____ MATH 3210 - Manifolds & Differential Forms **Discontinued:** _____ MATH 3230*
_____ MATH 3270 - Introduction to Ordinary Differential Equations*
_____ MATH 4130 - Honors Intro Analysis I*
_____ MATH 4140 - Honors Intro Analysis II
_____ MATH 4180 - Complex Analysis*
_____ MATH 4200 - Differential Equations and Dynamical Systems*
_____ MATH 4210 - Nonlinear Dynamics and Chaos*
_____ MATH 4220 - Applied Complex Analysis*
_____ MATH 4250 - Numerical Analysis and Differential Equations [also CS 4210]
_____ MATH 4260 - Numerical Analysis: Linear & Nonlinear Problems [also CS 4220]
_____ MATH 4280 - Introduction to Partial Differential Equations*

*See course descriptions at math.cornell.edu/upper-level-courses for information on **forbidden overlaps**.

Of the 9 courses used to fulfill requirements (1), (2), (3 iii), and (3 iv) of the math major, at least one course must be taken from three of the four Groups A, B, C, and D described on the next page. Non-MATH courses in these groups may be used toward the math modeling requirement (3 iv).

3. Concentration in Applied Mathematics. (___ transfer credit applied, see below)

Five additional courses from (iii) and (iv) below.

(iii) At least three MATH courses numbered 3000 or above:

_____ _____

_____ _____

_____ _____

_____ _____

(iv) At least one course dealing with mathematical models. Eligible courses include MATH 3610 and any course outside mathematics with serious mathematical content that deals with scientific matters. Serious mathematical content includes, but is not limited to, extensive use of calculus or linear algebra. Any course from another department that would satisfy one of the other concentrations may be used.

_____ _____

_____ _____

At most one of the following may be used:

_____ CS 2110 - Object-Oriented Programming and Data Structures [also ENGRD 2110]
_____ PHYS 1116 - Physics I: Mechanics and Special Relativity
_____ PHYS 2208 - Fundamentals of Physics II
_____ PHYS 2213 - Physics II: Electromagnetism
_____ PHYS 2217 - Physics II: Electricity and Magnetism [also AEP 2170]

Other 1000-level physics courses and PHYS 2207 may *not* be used. AP credit may *not* be used.

Transfer Credit / Study Abroad Courses Applied to the Major

Course Number &Title	Institution	Requirement

*See course descriptions at math.cornell.edu/upper-level-courses for information on **forbidden overlaps**.

Applied Mathematics Concentration

Of the 9 courses used to fulfill requirements (1), (2), (3 iii), and (3 iv) of the math major, at least one course must be taken from three of the four Groups A, B, C, and D below.

Group A. Differential equations

_____ MATH 3230 - Introduction to Differential Equations* (discontinued)
_____ MATH 3270 - Introduction to Ordinary Differential Equations*
_____ MATH 4200 - Differential Equations and Dynamical Systems*
_____ MATH 4210 - Nonlinear Dynamics and Chaos*
_____ MATH 4280 - Introduction to Partial Differential Equations*

Group B. Discrete mathematics and combinatorics

_____ MATH 3360 - Applicable Algebra
_____ MATH 4370 - Computational Algebra
_____ MATH 4410 - Introduction to Combinatorics I
_____ MATH 4420 - Introduction to Combinatorics II
_____ MATH 4550 - Applicable Geometry
_____ CS 4820 - Introduction to Analysis of Algorithms
_____ ECON 4020 - Game Theory I
_____ ECON 4022 - Game Theory II
_____ ORIE 3300 - Optimization I
_____ ORIE 4350 - Introduction to Game Theory

Group C. Numerical and computational methods

_____ MATH 4250 - Numerical Analysis and Differential Equations [also CS 4210]
_____ MATH 4260 - Numerical Analysis: Linear and Nonlinear Problems [also CS 4220]
_____ CS 4620 - Introduction to Computer Graphics
_____ CS 4670 - Introduction to Computer Vision
_____ MAE 4700 - Finite Element Analysis for Mechanical and Aerospace Design

Group D. Probability and statistics

_____ MATH 4710 - Basic Probability*
_____ MATH 4720 - Statistics*
_____ MATH 4740 - Stochastic Processes
_____ ECON 3130 - Statistics and Probability*
_____ ECON 4130 - Statistical Decision Theory
_____ ORIE 3500 - Engineering Probability and Statistics II
_____ STSCI 3080 - Probability Models and Inference* [also BTRY 3080, ILRST 3080]
_____ STSCI 3100 - Statistical Sampling [also BTRY 3100, ILRST 3100]
_____ STSCI 4030 - Linear Models with Matrices [also BTRY 4030]

*See course descriptions at math.cornell.edu/upper-level-courses for information on **forbidden overlaps**.